



NOAA Support for...

The US Ocean Action Plan

Gulf of Mexico

Regional Partnership

## Harmful Algal Bloom Prediction to Benefit Public Health and Coastal Economies

*Working with multiple partners in Southwest Florida, NOAA's Ocean Service (NOS) Harmful Algal Bloom Partnership Project will improve prediction of harmful algal blooms, which can negatively impact the local tourism and fishing industries as well as public health.*

In the Gulf of Mexico region, higher-than-normal concentrations, or blooms, of the toxic alga *Karenia brevis* produce a toxin that can make shellfish poisonous to people, cause massive fish kills, cause dolphin and manatee deaths, and produce an aerosol that can cause human respiratory irritation.

Providing advance warning of HABs can help coastal managers and the tourism and fisheries industries plan in order to reduce impacts from these blooms. While the current NOAA HAB Forecasting System supplies information on the location, size, and potential for development of HABs in the Gulf of Mexico, increased coordination of data and information will improve the precision of HAB prediction.

**NOAA's Ocean Service Harmful Algal Bloom Partnership Project** will involve working with partners to integrate tools, capabilities, and resources to generate an improved HAB Forecasting System with the capability to identify the onset of HABs and predict the transport of the blooms. Another goal of the project is to illustrate the scientific and socioeconomic value of integrated ocean observations in addressing key management issues such as HABs.

### Improved Harmful Algal Bloom Predictions

To improve prediction of HABs, the Harmful Algal Bloom Partnership Project will work to:

**Acquire and integrate needed ocean observation data.** Building on existing tools, capabilities, and resources, the project team will work with partners in the Gulf of Mexico to acquire and integrate ocean observation data. The project team will collect ocean observation data using advanced new technologies, including new biological sensors mounted on an autonomous underwater vehicle (AUV) glider and fixed to National Water Level Observation Network (NWLON) and Coastal Marine Automated Network (C-MAN) stations in Naples and Venice. This data will provide information on offshore subsurface blooms not currently identifiable by existing satellite imagery or available through standard monitoring programs.

**Improve the prediction of potential respiratory irritation at specific beaches.** A data base newly established by partners will allow the team to compile and monitor incidents of respiratory distress associated with HABs. Studies to link incidents of respiratory distress with confirmed incidents of HABs will allow researchers to identify the direct impact of blooms and determine how to most effectively use an improved HAB Forecasting System to predict respiratory impacts. The project team will also test the use of the Computer-Aided Management of Emergency Operations/Areal Locations of Hazardous Atmospheres (CAMEO/ALOHA) model system for predicting transport of toxic aerosols associated with HABs and thus for forecasting respiratory irritation at specific beaches.

**Develop an improved HAB Forecasting System to locate and forecast HABs before they reach the shore.** Newly collected data and improved prediction models will be merged into an improved HAB Forecasting System that will be accessible to coastal communities. For example, one aspect of the project will be to incorporate an existing Gulf of Mexico numerical model into the General NOAA Oil-spill Modeling Environment (GNOME) to demonstrate the real-time use of GNOME for bloom monitoring in west Florida. Advance warning of HABs can allow members of the coastal community to plan for bloom events and help mitigate the negative impacts of blooms on local communities, businesses, and visitors.

## The Value of Ocean Observations in an Integrated Approach

The Harmful Algal Bloom Partnership Project team will work with federal, state, and local resource management partners and coastal communities to better coordinate and integrate new and existing programs for gathering, analyzing, distributing, and applying ocean observation data and information. By taking an integrated approach, the resources and expertise available to manage HABs will increase.

Analyzing the socioeconomic impacts of information and tools developed during the project will help to demonstrate the value of applying integrated ocean observations to management issues and build support for such an approach. For example, as part of this project, partners will work to determine increases in emergency room visits that can be attributed to exposure to HABs. This study will be revisited after the improved HAB Forecasting System is in place to determine if there is a reduction in emergency room visits as a result of the new system.

Coastal communities, including local municipalities and the tourism industry, bear costs associated with HABs. Namely, coastal businesses such as hotels and restaurants may lose business during HABs. Additionally, local government sectors must spend time and money to clean up after a bloom, particularly those responsible for large fish kills. The costs of planning efforts, beach patrols, and cleanup will be estimated to demonstrate the value of applied ocean observations and related forecasting products.

This project will strengthen existing and build new partnerships between federal, state, and local officials, fostering long-term collaboration. Lessons learned throughout the project will assist future data sharing and integration in addressing issues in other coastal communities in the U.S. and abroad.

## Supporting the Gulf of Mexico Regional Partnership

The Harmful Algal Bloom Partnership Project is one of two partnership projects which are integral components of NOAA's support for the US Ocean Action Plan Gulf of Mexico Regional Partnership; the other project will work to enhance the resilience of coastal communities to storm surge inundation and coastal flooding. By employing the systematic collaboration and integration of effort specifically called for in the Ocean Action Plan, the partnership projects will help federal, state, and local Gulf of Mexico partners address management issues identified by the Gulf of Mexico Alliance as key priorities. For example, tools developed through the Harmful Algal Bloom Partnership Project will contribute to enhanced public health by improving ocean observing systems used to monitor water quality for shellfish beds and beaches.

Through the coordination and integration of new and existing projects, the Gulf of Mexico Regional Partnership provides an opportunity for NOAA to work with state and federal representatives to address many of the challenges in the Gulf, while helping to build regional ocean observation capabilities.

*The National Ocean Service (NOS) resides within the National Oceanic and Atmospheric Administration (NOAA). NOAA works to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs.*

## Partnership Project Team

- ♦ Mote Marine Laboratory
- ♦ University of Florida
- ♦ NOAA's Ocean Service
- ♦ NOAA's National Weather Service

## Partners

- ♦ Centers for Disease Control and Prevention
- ♦ Collier, Lee, Manatee, and Naples County
- ♦ Estero Bay Chamber of Commerce
- ♦ Florida Department of Agriculture and Consumer Services
- ♦ Florida Department of Environmental Protection
- ♦ Florida Department of Health
- ♦ Florida Fish and Wildlife Conservation Commission
- ♦ Solutions to Avoid Red Tide
- ♦ US Naval Research Laboratory
- ♦ US Environmental Protection Agency Gulf of Mexico Program
- ♦ University of South Florida
- ♦ NOAA's National Fisheries Service
- ♦ NOAA's National Satellite and Information Service

## For additional information

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